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ABSTRACT

Drawing from an overview of cloze research, this paper sets forth the thesis that the validity of the cloze technique and its usefulness as a measuring device have been clearly established, but its usefulness as a teaching device has not been so determined. Salient points of research are summarized as follows: (1) if rates of developing understanding vary with the student and with the connective, (2) if gains in understanding continue beyond age 12, (3) if types of errors reflect varying levels of understanding, and (4) if understanding connectives is important to reading comprehension, it follows that systematic instruction in context clues, structure words, and other aspects of syntactic relationships should yield increases in reading comprehension scores, regardless of the measures used. A scheme of eight types of context clues is then established, followed by various techniques to translate theory into practice. On the premise that context determines meaning, the paper next shows how an efficient means of transferring learning would be to develop new retrieval systems for the information the student already has. The paper views using context clues as hypothesis-testing and argues that the global communication skills are teachable and learnable through direct instruction by the cloze technique in any content area classroom. The paper concludes with recommendations for instructional applications at any grade level and a note about future research. (FL)

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Instructional Use of the Cloze:

Theory into Practice

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Table of Contents

The Theory.....1.

Theory into Practice.....8.

A Final Note.....20.

References.....21.

Appendix.....22.

The Theory

A review of research on context clues and the cloze technique yields this conclusion: The validity of the technique and its usefulness as a measuring device have been clearly established, but its usefulness as a teaching device is uncertain, as results of studies in this area have been either vague or conflicting.

Before examining possible procedures for research to establish such usefulness, let us look at salient questions on theory. The most obvious question is this: What does the cloze measure? The answer is less obvious, for there are almost as many answers as answerers. Anderson proposes that cloze measures are a function of concept achievement, especially in application to adult readers:

> It seems reasonable to expect that success in completing a section of cloze prose is primarily a function of (1) an understanding of how language goes together (syntactic skills) and (2) an understanding of what the author is trying to say (achievement in the subject matter area). As students attain a firm grasp of syntactic relationships (probably by age 12) the first variable becomes relatively constant, and one is left with the proposition that cloze measures are primarily a function of achievement (3. p. 83).

But this answer raises another question: Why does the first variable become constant by age twelve? Do students master syntactic intricacies by that age? Or could it be that, since systematic instruction in reading stops at about age twelve, or the sixth grade, this constant reflects not mastery but simply an arresting of growth? This question will be further

examined below.

The Jongsma and Rankin reviews of research agree that the cloze has been established as a valid and reliable measure of general reading achievement, as indicated by a high correlation with other accepted measures (7, 10).

Ames found fourteen distinct categories of context clues used by mature readers in cloze-type exercises (2). Although it is difficult to separate syntactic fluency and other language abilities from content achievement, an examination of Ames' list shows that many of the clues are structural rather than content-related clues. As that author points out, there is considerable overlapping of categories, but it is not the nubmer - fourteen or otherwise - which is important. Others see six, eight, or other numbers of classifications, yet the principles are the same.

Several factors in the Ames study make the category delineations suspect. One problem is that target words were not signified by blanks; instead, nonsense words were substituted. In almost every example reported in the published results, the nonsense word is the same length as the missing word. Since initial letter and word length are two key determiners of word recognition, the Ames study is not readily comparable to those using a standard cloze format. Further, no structure words were deleted. Thirdly, one source of passages was the Reader's Digest, and condensations of articles may produce different patterns than would the originals.

If, as is suggested, cloze exercises measure the ability to detect relationships, another question must follow. Is the reader's understanding of connective words important to reading comprehension? If it is, it should also be important to his ability to complete cloze exercises, regardless of the content area. Signals for syntactic relationships must be important, just as is the knowledge of such relationships. If Piaget's observation is valid, that children "use" language before they fully understand the logical relationships it establishes, then it seems quite unlikely that by age twelve - or even twenty - an individual will have reached total mastery of understanding both syntactic relationships and all signals which indicate them.

Separate studies have determined that some connectives are more difficult than others (11, 12, 14). In the Rodgers study, it was also discovered that the connective load varies from one subject to another:

1. in social studies texts (grades 6 and 12), approximately 575 connectives appeared per 100 pages.

2. in science texts (grades 6 and 12), almost 790 connectives appeared per 100 pages (12).

Beyond this variance, the Rodgers study also developed a list of the "top twenty" connectives - both in general and for each content area studied. It would seem that the less common connectives (hence, apparently) would present serious barriers to comprehension. More mature readers can be faced with such barriers, also: whereas, notwithstanding, heretofore, and such.

Since placement in the sentence is a variable also, it is necessary to consider not only the inherent difficulty of the connective word, but also its position, for this determines how long the meaning must be carried. Compare several placements of the word because:

1. Because it was raining and the game had been delayed, we returned later than had been expected.

2. We returned later than had been expected, because it was raining and the game had been delayed.

In the first placement, the meaning signalled by because must be carried much longer by the reader.

Robertson's findings have further implications which relate to question one. The study began with five null hypotheses, here summarized:

a. There is no significant relationship between connective understanding and seven variables: sex, mental age, chronological age, SES, listening ability, reading ability, and written language ability.

b. There is no significant increase in the understanding of connectives from grades 4 to 5 or from 5 to 6.

c. There is no significant difference in the rate of development of pupils' understanding of different connectives.

d. There is no significant variation in students' understanding of a connective within each grade; any variation can be explained by achievement variation.

e. There is no significant relationship between a student's understanding of a connective and his reading errors (11).

Except for the variables of chronological age and SES from hypothesis a., all hypotheses were found to be untenable. The implications seem to qualify - if not to contradict - the Anderson conclusion regarding achievement.

If rates of developing understanding vary with the student and with the connective, if gains in understanding continue beyond age twelve, if types of errors made reflect varying levels of understanding, and if understanding connectives is important to reading comprehension, it follows that systematic instruction in context clues, structure words, and other aspects of syntactic relationships should yield increases in reading comprehension scores, regardless of the types of (accepted) measures used. Further, increases in syntactic fluency in reading should be accompanied by similar increases in writing and other communication skills.

Before discussing the planning of such instruction, another question is necessary: How many types of context clues are there? Again, the answer depends on who gives it. According to Ames, there are at least fourteen discrete categories. Other writers employ larger categories and propose that there are fewer types, perhaps five or six. To complicate matters further, some clues are clues to an exact word, while others are clues to areas of meaning. Perhaps establishing the exact number and delineation of clues is less important than finding workable strategies for instruction within the parameters of the constraints of context.

To that end, what follows is a scheme of classification which will serve as a framework for a methodology of teaching.

1. The language experience or familiar expression clue - here the clue may be to the exact word, and not merely to the meaning. The missing word in a familiar phrase or expression can be determined through language experience.

A. He was caught between the (devil) and the deep blue sea.

B. I object to that testimony on the grounds that it is irrelevant, immaterial, and (inconsequential).

Interestingly, the general meaning may hold even if the reader supplies the wrong denotation for the missing word; in example A., the word devil does not refer to satan but to a part of the keel of a ship. Even with the incorrect denotation, however, the reader retains the essential meaning that the subject is in dire straits - another term with two denotations but essentially one meaning.

2. The comparison or contrast clue - by comparison or contrast with another word or element in the sentence or paragraph, the meaning is made clear.

A. In addition to satisfying his physiological needs, man must also attend to his (psychological) needs.

B. He was surprised to find his opponent so easily (intimidated), for he expected an unyielding foe.

3. The definition clue - the missing word is defined by the remainder of the sentence or passage.

A. An (enzyme) is a complex organic substance which catalyzes chemical changes, especially in digestion.

B. If (democracy) is rule by the people, it makes little sense to apply the word to our present system of government.

4. The synonym, repetition, or series clue - through repetition or a related series, the meaning is indicated.

A. Stung by the blow, he staggered and (fell).

B. Satire and parody both employ (hyperbole), for exaggeration is the essence of both forms.

5. The description of modification clue - a modified or modifying word or element reveals the area of meaning of another word or element.

A. The family, continually on the move, lived in abject (poverty).

B. The condition of his life was disorganized (clutter): his desk, his house, his brain, his life.

6. The setting, mood, or tone clue - here the clue may span several sentences, and depends on associations with the overall ambience.

A. I was grateful that all was finally dark and quiet. A sense of (peace) came over me.

7. The conditional, causal, or other relationship - this category embraces many types of relationships. Although Ames lists separate clues for different relationships, I believe the meaning in each case to be accessible by the same means: the reader finds a signal to determine the relationship(s)

between (or among) words or other elements, and then derives a clue to meaning. Elements may be phrases, clauses, appositives, or other grammatical structures, but we are less concerned with grammatical than with syntactical relationships.

A. If it doesn't rain, it will be a (good) day to hold the picnic.

B. You (spilled) the milk because you weren't watching what you were doing.

8. The paragraph or whole passage development clue - the meaning of a word in the main-idea sentence of a paragraph may be derived from elements in the supporting details or conclusion. Similarly, clues to words in the details or conclusion may reside in the main idea sentence.

A. The cigarette industry was in (trouble). No longer could cigarettes be advertised on television, and sales had fallen off drastically.

B. There never seems to be enough time. Try as we may to plan ahead, we usually find ourselves doing things in a (rush).

As will be shown below, this last type of clue can be used for inferring blocks of meaning larger than one word.

Theory into Practice

Using context clues is inferring meaning. The reader must base his conclusion about the unknown on something he already knows, on part of his existing cognitive structure. An efficient way to do this may be to develop new retrieval systems for the information he already possesses.

Frank Smith's scheme of the organization of cognitive structure suggests that it is organized by:

1. a system of categories, abstractions
2. sets of rules for the assigning of categories
3. a network of relationships among categories
   a. class inclusion
   b. property relations
   c. actions(13).

From this scheme he projects the basic learning process as hypothesis-testing, starting with the existing condition of the individual's cognitive structure. As he sees it, the individual will generate a hypotheses, test it, evaluate the feedback, and then confirm, reject, or modify the hypothesis.

Using context clues is also a form of hypothesis-testing. Since the scheme of context clues offered above covers the five global skills of reading comprehension, reading as hypothesis-testing can be the focus of instruction with the cloze technique.

The five skills are these:

1. word knowledge and word-attack skills
2. ability to find generalizations and details
3. ability to draw inferences and conclusions
4. ability to recognize pattern of development or organizing principle
5. sensitivity to tone, mood, and atmosphere.

It is difficult to discuss even a global skill as a thing in itself, divorced from other aspects of reading. Elementalism, the tendency to see isolated parts rather than complex re-

lationships, has contributed to much improper reading and writing instruction, and improper education in general. Skills taught in isolation - and some categorizers list scores of separate subskills, each with an instructional package - are learned, if at all, in isolation.

To avoid this unhappy result by developing a global skills approach, the teacher must define his purpose. The teacher must ask: What do I want as an outcome of instruction? I believe the cloze form can be used for teaching what Jane Algozzine calls the "whole values of comprehension (1)." With the possible exception of certain aspects of mechanics, there is no part or reading or writing instruction which could not be approached with carefully-designed cloze forms. If a great effort needs to be made here, the difficulty should not lie in establishing relationships; it lies, rather, in making visible the relationships which are there. Beyond analysis must come synthesis, for reading is synthesizing meaning from the printed page.

Here is a partial list of topics which could be learned through direct instruction with the cloze technique.

words:	diction, word choice, nuances of words, denotations and connotations, affixes, morphemes, parts of speech, function in sentence, propaganda, jargon, gobbledegook, imagery.
sentences:	sentence structure, subordination, apposition, establishing relationships, sentence variety, purposes and forms of sentences, modification and qualification, agreement.

larger units: topic sentence placement, methods of development (10-12 methods), patterns of organization (10 patterns), transition, forms of communication (expository, etc.), establishing setting, tone, and mood, logical forms.

A cautionary note. What happens in experimental applications of new treatments? It is estimated that 9 of 10 research studies result in no significant differences between control groups and treatment groups. Since most teacher-designed instruction is not subject to the rigors of an evaluation design, one must be quite cautious about predicting the usefulness of a device or strategy for instruction, for such usefulness will have to be established in demonstrable, replicable fashion. Although the purpose of this paper is to suggest instructional applications, and not to report on them, it is still necessary to consider proper measurement and design for future research.

In his major review of cloze research, Jongsma points out five major areas of weakness of earlier research:

1. there was no real teaching
2. there was no focus on type of reading growth anticipated
3. many experimental designs were flawed
4. measurement problems such as regression contaminated results
5. reporting of subjects, treatment, design, and results were incomplete (7).

The Jongsma review goes on to give detailed directions for conducting future research, including such aspects as improving experimental design and measurement, standardizing scoring and reporting, and focusing on instruction.

What is missing is the <u>why</u>, the central purpose for using

the cloze or any other device. Quite simply, the cloze should be used to teach the relationships important to reading, writing, speaking, and listening; content can be learned through these communication skills, as reading ability remains the primary determiner of success in elementary and secondary school.

Until now, most efforts have tried to teach content directly through completion of cloze exercises, with no real instruction. Not surprisingly, conclusions have shown little success. As completing grammar exercises does not make a writer, completing cloze exercises does not make a reader, and certainly does not make an historian, scientist, or mathematician.

It can, however, make a careful and sensitive reader and, in turn, a competent and effective writer.

If there are only words and the relationships among words, then word-attack skills and relationship-attack skills would seem to be the keys to reading and verbal learning. These skills operate at various levels. At the micro level--vocabulary and word-attack--the cloze can be used with morphemes and affixes, as in (re)gress(ion). At the macro level--whole passages, chapters, books--the cloze can be used for pattern analysis and sensitivity to structure. If the general pattern of a problem-solving piece of writing is this...

problem(s)
  effect(s)
  cause(s)
solution(s)
significance

...various whole elements can be deleted to cause students to focus on larger blocks of meaning. In a thesis-proof approach,

from a solitary thesis many implications can be predicted, and so can other relationships be dealt with in this way.

Between these two levels, where the traditional cloze operates, lie the syntactic and grammatical relationships within and between sentences.

If we remember that reading is an active and synthetic process, with or without deletions, we can use the cloze to develop multiple reading processes, first through analysis, and then through synthesis (6). When the eye is looking for detail, i.e., one-word deletions, it cannot be fully attending to main ideas and implications, which should come first. Perhaps the ultimate goal of cloze instruction might be to need no more cloze instruction, after students have fully mastered word-attack and relationship-attack skills.

As indicated above, the majority of extant studies do not offer much which is substantive about the instructional use of cloze exercises or context clues. An ERIC report cites an instructional sequence developed by Bortnick and Lopardo as follows:

1. student reads cloze passage
2. student re-reads passage, writing in words in the blanks
3. student offers reasons for his choices
4. student compares his answers with the original
5. students discuss and compare their answers with the original (4).

This sequence will serve as a general guide, but in attempting to make visible the invisible process of making meaning out of print, I would suggest some more specific steps:

1. Define the instructional purpose clearly, including

how its accomplishment will be measured.

2. Explain this purpose to students before introducing procedure. Teaching should not be a blind study, and especially not a blind-leading-the-blind study.

3. Present types of clues (or other procedures) in groups, not one at a time, and quickly present all of them. Students (and teachers) can then see the overlapping of categories and the uniformity of process. They will also note that the same sentence may be approached in various ways. What might be a language experience clue for one reader might be a contrast clue for another. Focus on the one process, not the eight categories.

4. Have students work individually, in small groups, and in a large group, perhaps in that order. They should explain reasons for their choices--what key words signal meaning--and then compare their choices and reasons with those of their classmates. This tutorial approach is useful in developing hypothesis-testing; if students know they will be asked to defend their answers in a small group, they choose more carefully.

5. Suit the format to the grade level and the purpose.

a. Exercises can be constructed in varying formats, depending on the aims and purposes of instruction. Students may be asked to fill in blanks, with no clues given as to word supplied, the correct number of letters indicated, or both.

b. For affix and morpheme analysis for word-attack, an affix or morpheme could be provided, as in ab_____for the deletion abstain, or___monit___for the deletions premonition or

admonition. The reader can derive the meaning from the word or the word from the surrounding meaning, but he must have a place to start.

c. The multiple choice format offers other possibilities. This format could be used to create either quite easy or quite sophisticated discriminations, depending on the form of the distractors. The difficulty can lie not in the degree of difficulty of the reading passage, but rather in the type of discrimination the reader must make between correct answer and distractors. Consider the differences in the degree of difficulty in the following tasks, all based on the same sentence:

> It is now considered very old-fashioned and _____ to speak of an author's"philosophy of life" as something that can be harvested from his work(8).

task 1 - the student fills in the blank.

task 2 - the student fills in part of the blank, as in taste or _____less.

task 3 - the student chooses from this group, where distractors are neither grammatically nor semantically plausible:

infidel
quickly
walk
tasteless
because

task 4 - the student chooses from this group, where distractors are grammatically but not semantically plausible:

contradictory
tasteless
exciting
inspiring
gratifying

task 5 - the student chooses from this group, where distractors are both grammatically and semantically plausible:

tasteless

trite
useless
witless
dull

The differences among these questions point out the hazards of relying solely on formulae or publishers' data in determining the degree of difficulty of a reading task. Without knowing the degree of difficulty of the question task, the passage difficulty means little.

d. Consider this passage from Robert R. Potter's Making Sense(9):

> Typhus fever and typhoid fever are often confused. The former is caused by Rickettsia prowazekii and R. mooseri often transmitted by Pediculus vestimenti. The latter, however, is associated with Salmonella agents and produces customary anorexia.
>
> 1. Rickettsia _____ is a cause of typhus fever.
> 2. Typhus fever is transmitted by _____.
> 3. _____ agents are associated with typhoid fever.
> 4. Typhoid fever produces _____.
> 5. Aside from words, this reading has taught me almost _____.

That an intelligent reader can manipulate the words without attending to meaning indicates the importance that structure words and other signals to relationships have in the task of answering questions. Answering and understanding are not the same.

e. Let us return to purpose. Task 3 can be an exercise in grammar; task 4, in semantics or syntax; and task 5, in connotation or style. Exercises of the nature of task 5 may be regarded as having neither "right" nor "wrong" answers; the point here is that different words produce different shades of

meaning. For other tasks, error patterns can be used for miscue analysis.

It appears to me that, for general use, the simple deletion format is most workable, for the time-consuming task of developing proper distractors is eliminated. By comparing answers in large and small groups, discriminations among synonyms or related words can be discussed to point out nuances of words, shades of meaning, and other stylistic or semantic considerations. In effect, the in-class comparison serves the same purpose as the distractors.

f. Regardless of the format, the exercises must be directly related to the types of reading students must do. Below are some applications for various courses of study:

1. A short exercise can call attention to the main idea of a physics chapter, the differences between weight and mass.

2. A word problem in math could delete either one of the elements or a structure word, in order to call attention to relationships.

3. A historical cause-effect passage could delete the cause, the effect, or the structure word(s) indicating the relationship, e.g., "As a result..."

4. An essay in English class could delete nouns or modifers to call attention to description and style.

5. A business letter could delete every n^{th} word, for practice for transcription students in seeing and hearing in thought-units instead of word-units.

6. In addition to format, other considerations are necessary. As is true with most subskills of reading, context-clue instruction can be initiated by a workbook approach, but this is useful only as a beginning, as a point of departure.

To be realistic, materials should not consist solely of canned exercises, those written expressly for the purpose. The most useful materials will be those which most nearly replicate the conditions of context which normally obtain in the type of reading the student encounters.

7. The deletion strategy to be employed is another matter of choice for the preparer of materials. Although Rankin (10, p. 146) concludes that any-word deletion measures syntax or structural meaning, and lexical measures knowledge of substantive content, no consensus exists about this dichotomy, particularly with respect to readers of all ages and materials of all types. For measurement purposes, deleting every 5^{th} word--regardless of the type of word--yields reliable results. For the purposes of this paper, the question of the hypothetical dichotomy may be moot: as long as a combination of strategies covers the types of clues which operate in ordinary context, it is sufficient to say that there are individual words and relationships between the words, and different deletions will call attention to different aspects of comprehension. Further, the same sentence can hold different clues for readers of varying background and maturity.

8. Length of exercises is another variable. For measurement

purposes, exercises of fifty blanks are useful. They are easy to score, long enough to be reliable, and yet short enough to be completed within a reasonable period of time, say, 30-45 minutes. For instructional purposes, length is not much of a factor. Neither, for that matter, is the space between deletions. The type of deletion draws attention to the focus of instruction, to the particular aspects of context the teacher wishes to explore. In every n^{th} word deletions for measurement, however, the first and last sentences of a passage should be left intact (5).

9. Choices among scoring options should be made with purpose in mind. It seems advisable to accept only the exact word when using the cloze for diagnostic or measurement purposes. For instruction, close synonyms should be accepted. As Rankin points out (p. 10, 146), Accepting synonyms..."has face validity from the student's standpoint and gives more reinforcement." Since the word is unequal to the thought, the focus of instruction will most usually be deriving the meaning, and not necessarily in deriving the exact word. However, as shown above with the multiple choice groups, considerations about diction, word choice, and tone will at times require attention to the exact word.

Bormuth modified cloze scoring to create a degrees of reading power test, one used as a standard of minimum competency in New York State. The test is supposed to be free of regression effects and other statistical undesirables, and might be a good instrument to use for a residual gains evaluation design.

Future studies must make careful selection among measurement alternatives, but here we are more concerned with treatment than with measurement.

A Final Note

Lest my own charge of elementalism be levelled against me, I will say that measurement must be an important consideration, but it is not the point. Instruction is the point, and measurement must be tailored to suit instruction. Previous studies have seemed to work in the other direction, as if endless rounds of completing cloze exercises were a substitute for teaching. Almost everything but reading or writing has been the focus of instruction.

Future research can yield results about the value of cloze instruction only when the instructional design is as carefully crafted as the evaluation design, when the researcher begins with a thoughtfully planned purpose of instruction and subordinates the other aspects of the designt to the guiding purpose of instruction.

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Appendix

The appendix consists of fifteen passages of selective deletion as examples of materials for diagnostic and instructional purposes. Each of three passages -- representing historical, scientific, and literary prose at a relatively difficult level -- appears in five versions, with deletions as follows:

a. every n^{th} (5^{th}) word deleted
b. nouns deleted
c. verbs deleted
d. modifiers deleted
e. structure words deleted